for once admit the divinity of the Word from eternity, and you must admit his divinity to eternity; that is, no one would suppose that God would cease to be God, and you would not go out of your way to prevent a person falling into an error into which he was not likely to fall.

3rd. As the word "Word" occurs three times in a short sentence, the emphasis on the first "Word" is stronger than on the other two, and the emphasis on "with" relatively stronger than it would be if the first proposition were omitted. Again, the word "God occurs twice, and the emphasis on the first "God" is greater than on the second, and consequently, the emphasis on "was" is relatively stronger than if the third proposition stood alone.

4th. If it be any satisfaction to Mr. Harrison I will admit that Dr. Watts agrees with him in one of his least effective stanzas, the third line being its weakness.

"Ere the blue heavens were stretch'd
From everlasting was the Word;
With *God* he *was*, the *Word* was *God*,
And must divinely be ador'd."

And lastly, as to Mr. Harrison's sneer about Barnes, Scott, and others, I will merely remind him that many of the best orators have known nothing of the rules, and many who were well up in the rules have been but ordinary readers, simply because, while the natural orator would be very little better for rules, the ordinary reader would be much worse without them.

J. H. KNIGHT,
Lindsay, May 20th. 1880. P. S. Inspector.

Mathematical Department.

Communications intended for this part of the JOURNAL should be on separate sheets, written on one side only, and properly paged to prevent mistakes They must be received on or before the 20th of the month to secure notice in the succeeding issue, and must be accompanied by the correspondents' names and addresses.

UNIVERSITY OF TORONTO.

ANNUAL EXAMINATIONS, 1880.

First Year Mathematical Papers.

ARITHMETIC AND ALGEBRA.

Examiner: F. HAYTER, B.A.

1. Enumerate the points of difference between algebra and arithmetic.

2. Given $a=3$, $b=4$, $c=-5$, find the value of
$(3a+4b+5c)^2+(4a+3b+12c)^2-(5x+5y+13z)^2$
Given $a=2$, $b=1$, $c=0$, find the value of
$$(a^{b-c}+b^{c-a}+c^{a-b})\div(a^b+b^c+c^a)$$

3. Simplify

(1) $\left(a-5b-\left\{a-(5c-\overline{2c-b}-4b)+2a-(a-\overline{2b+c})\right\}\right)$

(2) $a-2\left(b+3\left\{a-2(b-c)+2b-3(a-b+2c)\right\}\right)$

4. Find the value of

(1) $\dfrac{1+2x}{(3-x)(1+x)}+\dfrac{7}{(2+x)(1-3x)}+\dfrac{x}{(1+x)(2+x)}$

(2) $\dfrac{1-x}{1+x}+\dfrac{1-x-x^2}{1+x+x^2}+\dfrac{1-x-x^2-x^3}{1+x+x^2+x^3}$

(3) $\dfrac{x^{3n}}{x^n-1}-\dfrac{x^{2n}}{x^n+1}-\dfrac{1}{x^n-1}+\dfrac{1}{x^n+1}$

5. Describe Horner's method of division.
Divide according to Horner's method:
$4x^5-7x^4+25x^3-15x^2+8x+10$ by x^3-x+5
$6a^4-a^3b+2a^2b^2+18ab^3+4b^4$ by $2a^2-3ab+4b^2$.

6. Prove the rule for finding the least common multiple of two quantities.
Find L. C. M. of $(21x^2-26x+8)$ and $(7x^3-4x^2-21x+12$.

7. Solve

(1) $(12+x)^{\frac{1}{3}}=2+x^{\frac{1}{3}}$

(2) $\dfrac{x}{2}-\dfrac{\frac{1}{2}(2x-3)-\frac{1}{4}(3x-1)}{\frac{1}{2}(x-1)}=\dfrac{3}{2}\left(\dfrac{x^2+2}{3x-2}\right)$

(3) $\dfrac{66x+1}{1\cdot5x+1}+\dfrac{4x+5}{\cdot5x-1}=52.$

(4) $\dfrac{\sqrt{a}-\sqrt{a-\sqrt{a^2-ax}}}{\sqrt{a}+\sqrt{a-\sqrt{a^2-ax}}}=b.$

8. Find the fraction which, if 1 be added to its numerator, becomes $\frac{1}{2}$; but if 1 be added to its denominator becomes, $\frac{1}{3}$.

Two persons A and B could finish a work in m days; they worked together n days when A was called off, and B finished it in p days. In what time could each do it?

9. Solve

(1) $\left(x+22\right)^{\frac{1}{3}}-\left(x+3\right)^{\frac{1}{3}}=1$

(2) $\dfrac{(a-x)^4-(x-b)^4}{(a-x)-(x-b)}=\dfrac{(a-b)c}{(a-x)(x-b)}$

(3) $\begin{cases} x+y+xy=11 \\ x^2y+xy^2=30 \end{cases}$

(4) $\begin{cases} x^{\frac{3}{4}}+y^{\frac{3}{5}}=126 \\ x^{\frac{1}{4}}+y^{\frac{1}{5}}=6 \end{cases}$

10. The sum of two numbers added to the sum of their squares is 42, and their product is 15. Find the numbers.

If \$300 be laid out at simple interest for a certain number of years, it will amount to \$360. If the same be allowed to remain two years longer, and at a rate of interest one per cent. higher, it will amount to \$405. Find the rate and number of years.

11. Given the first term, common ratio, and number of terms in a geometrical progression, find the sum.

If a, b, c be in G. P. Prove
$$(a^2+b^2+c^2)>(a-b+c)^2$$

EUCLID.

Examiner: A. K. BLACKADAR, B.A.

1. Any two sides of a triangle are together greater than the third side.

If a point be taken within a parallelogram, the sum of its perpendicular distances from the sides of the parallelogram is less than the sum of the diagonals.

2. If the side of any triangle be produced, the exterior angle is equal to the two interior and opposite angles, and the three interior angles of every triangle are together equal to two right angles.

From the base BA, or BA produced, of the isosceles triangle ABC, BD is cut off equal to the side BC; from DC, DE is cut off equal to BC; prove that the angle DCA is double of the angle CBE.

3. Triangles upon equal bases, and between the same parallels are equal to one another.

The angle BCA of the triangle ABC is bisected by the straight line CE which meets AB in E; CA is produced to D so that AD is equal to BC; prove that the triangle CED is equal to the triangle ABC.

4. If a straight line be bisected, and produced to any point, the